

## **PU020393 (JP10247926) ON 8793**

(19) Patent Agency of Japan (JP)

(12) Official report on patent publication (A)

(11) Publication number: 10-247926

(43) Date of publication of application: 14.09.1998

(51) Int.Cl. H04L 12/28 H04M 3/00 H04M 3/42  
H04M 3/50

(21) Application number: 9-063873

(22) Date of filing: 03.03.1997

(71) Applicant: Victor Co of Japan LTD

(72) Inventor: Kumagai Nobuaki

(54) Title of the invention: LAN communication  
equipment

(57) Abstract:

Problem to be solved: To prevent mischief by other parties than a manager without restriction on the position of the equipment that manages LAN event information such as problem information of extension terminals and charge information is not limited.

Solution: A system service database 4701 stores problem information occurred in a LAN, its notice destination, problem information and its notice destination caused in a LAN, notice destination of charge information and a notice date and time, and a notice destination of a voice mail. A system control section 4500 and a charge log management section 4705 manage and store a speech time, notice destination and a charge in interlocking with each other. The system control section 4500 manages problem information of extension terminals and a public network from a protocol converter 101 or the like, an error processing section 4600 detects a problem based on the

presence of a reply command and the problem information is stored in the database 4701. A voice mail function section 4704 stores tentatively a voice mail or the like for absent mobile stations 301-304. On the occurrence of a problem, the system control section 4500 informs it of the notice destination based on the database 4701.

### **[Claims]**

[Claim 1] A LAN communication device which can communicate with a communication line besides LAN by an interface by protocol conversion, a LAN communication device which includes a memory means which stores the event information while storing preliminary a report destination of event information generated in LAN, and an event information reporting means which notifies event information stored by the mentioned above event information storage means to the report destination.

[Claim 2] The LAN communication device according to claim 1 notifying promptly problem information stored by the mentioned above event information storage means to the report destination, storing the mentioned above event information storage means while it stores preliminary a report destination of problem information generated in LAN, and the problem information, the mentioned above event information reporting means.

[Claim 3] The LAN communication device according to claim 1 or 2 notifying charge information stored by the mentioned above event information storage means at the time of the report destination and a declaration day, storing the mentioned above event information storage means while it stores preliminary the time of a report

destination of charge information generated in LAN, and a declaration day, and the charge information, the mentioned above event information reporting means.

[Claim 4] The LAN communication device according to claim 1 to 3 notifying the mentioned above report destination promptly when voice mail is stored by the mentioned above event information storage means, storing the mentioned above event information storage means while it stores preliminary a report destination of voice mail which received a message, and the voice mail, the mentioned above event information reporting means.

### **[Detailed description of the invention]**

[0001] [Field of the invention] This invention relates to a LAN (Local Area Network) communication device.

[0002] [Description of the prior art] In this kind of LAN communication device, the device which performs the protocol conversion between the extension terminal of a wired system or radio system, and LAN and a main wire on LAN, and the communication control unit which performs line control between extensions and between an extension and a main wire are connected. Conventionally, the event information of LAN, such as problem information of an extension terminal etc. and charge information, is managed and displayed or it includes this kind of a communication control unit so that it may be printed out.

[0003] [Problems to be solved by the invention] However, in the mentioned above conventional communication control unit, the event information of LAN, such as problem information of an extension terminal etc. and

charge information, is displayed or it prints out, a setting position is limited so that the communication control unit itself may be installed in the place which an administrator tends to operate, thus it may be easy for an administrator to operate. On the other hand, when a communication control unit is installed in the place in which it is easy to operate, there are problems, like there is a possibility that a problem will occur by operation by persons other than an administrator.

[0004] In view of the mentioned above conventional problem, the setting position of the device which manages the event information of LAN, such as problem information of an extension terminal and charge information, is not limited, and this invention by operation by persons other than an administrator. It aims at providing the LAN communication device which can prevent a problem from occurring.

[0005] [Means for solving the problem] This invention stores the event information and notifies event information to the report destination while it stores preliminary a report destination of event information generated in LAN to achieve the above objects. Namely, according to this invention, it is a LAN communication device which can communicate with a communication line besides LAN by an interface by protocol conversion, a LAN communication device which has a memory means which stores the event information while storing preliminary a report destination of event information generated in LAN, and an event information reporting means which notifies event information stored by the

mentioned above event information storage means to the report destination is provided.

[0006] [Embodiment of the invention] Next, an embodiment of the invention is described with reference to drawings. Drawing 1 is the block diagram showing one embodiment of the LAN communication device according to this invention, drawing 2 is the block diagram showing the communication control unit of drawing 1 in details, drawing 3 is the explanatory view showing the registration data of the system service database of drawing 2, and drawing 4 is the flow charts for explaining the notice processing of event information of the system control section of drawing 2.

[0007] In drawing 1, the communication control unit 401 indicated in detail to be the protocol conversion devices 101, 102, 201, 202 and in drawing 2 the terminals 601, 602, 603 is connected to LAN 501. The protocol conversion devices 101, 102 have a main wire interface for connecting with the LAN interface and the public network 901 for connecting with LAN 1 and perform the protocol conversion between LAN 1 and the public network 901. The protocol conversion devices 201, 202 have a wireless interface for performing radio between the LAN interface for similarly connecting with LAN 1 and the mobile stations 301, 302, 303, and perform the protocol conversion between LAN 1 and the mobile stations 301, 302, 303.

[0008] The communication control unit 401 has the database 4100 for line control with the communication processing part 4400, the command processing part 4300, the line connection treating part 4200, the system control

section 4500, the error-handling part 4600, and the service-function section 4700, as shown on drawing 2 in details. The service-function section 4700 has the system service database 4701, the system construction part 4702, the indicator 4703, the voice mail function section 4704, and a charge log management section 4705. The report destination of the voice mail for every extension number is remembered to be the time of the problem information generated in LAN as shown on the system service database 4701 and its report destination at drawing 3, the report destination of charge information, and a declaration day (or amount of money). Voice mail is stored by the voice mail function section 4704, and phone-call charges are stored by a charge log management section 4705.

[0009] The area 4101 for the database 4100 for line control to store the management data of the protocol conversion devices 101, 102, it has the area 4102 for storing the management data of the protocol conversion devices 201, 202 and the area 4103 for storing the management data of the mobile stations 301, 302, 303.

[0010] In such composition, when the mobile station 301 sends, it is received by the protocol conversion device 201, the protocol conversion of the call setup command transmitted from the mobile station 301 is carried out, and, next it inputs into the communication control unit 401 by LAN 501. In the communication control unit 401, the communication processing part 4400 receives this call setup command, and it sends to the command processing part 4300.

The command processing part 4300 will send this confirmed information to the line connection treating part 4200, if it checks that this input is call control information.

[0011] The empty information on a mail arrival place mobile station in the mobile station management data area 4103 in the database 4100 for line control at the time of extension connection when this information inputs the line connection treating part 4200, and the empty information on the protocol conversion devices 201, 202 used as the communication relay group of the mail arrival place mobile station in the area 4102 is checked, at the time of outside line connection, the empty information on the protocol conversion devices 101, 102 in the area 4101 is checked, and a call setup allow command is sent to the command processing part 4300.

[0012] The command processing part 4300 sends this call setup allow command to the system control section 4500, if this call setup allow command inputs the system control section 4500, a call setup command by command processing part 4300, communication processing part 4400 and LAN 501, at the time of extension connection, it sends to the protocol conversion devices 201, 202 and sends to the protocol conversion devices 101, 102 at the time of outside line connection.

[0013] Next, if this call setup command is sent to a mail arrival place mobile station by the protocol conversion devices 201, 202 at the time of extension connection, a mail arrival place mobile station receives this call setup command and call setup receptionist information is returned to the communication control unit 401,

the call between the mobile station 301 of an origination side and a mail arrival place mobile station is connected. The protocol conversion of the call setup command outputted from the communication control unit 401 at the time of outside line connection is carried out by the protocol conversion devices 101, 102, and it is sent to the public network 901 as a control signal of a call setup, next, if the receptionist signal of a call setup inputted from the public network 901 is returned to the communication control unit 401 by the protocol conversion devices 101, 102, the call between outside line terminals will be connected with the mobile station 301 of an origination side. At the time of cutting, a call clear-down command and a call clear-down receptionist command are exchanged.

[0014] And in the communication control unit 401, when relaying the call control signal of the mentioned above call connection and call clear-down, the charge log management section 4705 and the service-function section 4700 in the system control section 4500 cooperate, and duration of call, call destinations, and a charge are managed and stored. The system control section 4500 from the protocol conversion devices 101, 102, 201, 202 to an extension terminal. The problem information of a public network is managed, further, the error-handling part 4600 detects an obstacle by the existence of a response command, etc., and such problem information is stored by the system service database 4701 shown on drawing 2.



The voice mail function section 4704 accumulates temporarily the voice mail from voice mail with the absent mobile stations 301-304, the voice mail set up preliminary, a mail arrival extension or outside line.

[0015] The system control section 4500 registers into the system service database 4701 the report destination of the problem information preliminary inputted from the system construction part 4702, the report destination of charge information, and the time of a declaration day and the report destination of voice mail at the time of a system startup, etc. And the system control section 4500 notifies problem information (Step S1, S2), charge information (Step S3), and voice mail (step S4) to that registration information point based on the setup information stored by this database 4701, as shown on drawing 4 (Step S5, S6).

[0016] For example, if the system control section 4500 detected the obstacle in a system (Step S1, S2), while displaying the obstacle on the indicator 4703, it notifies promptly to a system administrator's outside line terminal 701 preliminary registered into the system service database 4701 (Step S5). In this case, management of a system is entrusted to an external service company etc., and that service company owns the communication control unit 401, and may be made to notify an obstacle from the communication control unit 401 to the outside line terminal 701 of that service company.

[0017] About charge information, a certain calculation period is further registered into the system service database 4701 preliminary, a charge is calculated for every registered calculation period, and it may be made to

notify to the outside line terminal 701 at the time of a designated date (step S3->S6), and when the telephone call beyond the utilization charge preliminary registered within the period registered further preliminary occurs, it may be made to notify to the outside line terminal 701. It may be made to notify to one of the terminals 601-603 of an extension as a report destination. It is a case where e-mail newly arrives, for example to the mobile station 303, and when the power supply of the mobile station 303 is OFF, it may be made to notify one of the terminals 601-603 of an extension that e-mail newly arrived about voice mail (step S4->S5).

[0018] [Effect of the invention] Since according to this invention the event information is stored and event information was notified to the report destination while storing preliminary the report destination of the event information generated in LAN as explained above, a problem can be prevented from the setting position of the device which manages the event information of LAN, such as problem information of an extension terminal and charge information, not being limited, and occurring by operation by persons other than an administrator.

### **[Brief description of the drawings]**

[Drawing 1] is a block diagram showing one embodiment of the LAN communication device according to this invention.

[Drawing 2] is a block diagram showing the communication control unit of drawing 1 in details.

[Drawing 3] is an explanatory view showing the registration data of the system service database of drawing 2.

[Drawing 4] is a flow chart for explaining the notice processing of event information of the system control section of drawing 2.

### [Description of numerals]

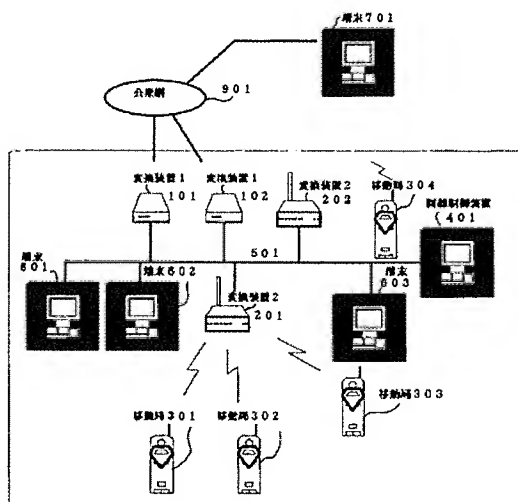
4500 System control section (event information reporting means)

4701 The system service database (memory means)

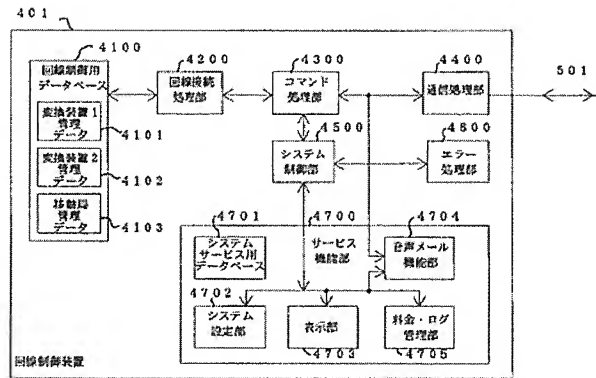
4704 Voice mail function section (memory means)

4705 A charge log management section (memory means)

Drawing 1



# Drawing 2



# Drawing 3

| イベント | 通知先   | 通知日時   |
|------|-------|--------|
| 障害   | 通知先 1 | なし     |
| 料金   | 通知先 2 | 通知日時 1 |
| 内線 1 | 通知先 3 | なし     |
| 内線 2 | 通知先 4 | なし     |
| 内線 3 | 通知先 5 | なし     |

# Drawing 4

